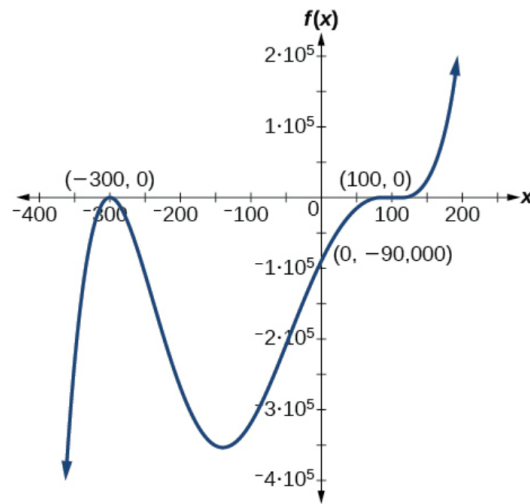


## Exercise 74

For the following exercises, use the graphs to write a polynomial function of least degree.



### Solution

Use the labelled  $x$ -intercepts to write the model polynomial function.

$$f(x) = A(x + 300)^2(x - 100)^3$$

The factor  $(x + 300)$  is squared because the graph bounces back after hitting the  $x$ -axis, and the factor  $(x - 100)$  is cubed because locally at  $x = 100$  the graph is cubic. Use the labelled  $y$ -intercept to determine  $A$ .

$$-90\,000 = A(0 + 300)^2(0 - 100)^3 \quad \rightarrow \quad -90\,000 = A(-90\,000\,000\,000) \quad \rightarrow \quad A = \frac{1}{1\,000\,000}$$

Therefore,

$$f(x) = \frac{1}{1\,000\,000}(x + 300)^2(x - 100)^3.$$